

WHAT IS CLAIMED IS:

- 1 ~~1.~~ A method for decoding a pair of quadrature signals, the method comprising:
 - 2 a) obtaining a first sample;
 - 3 b) determining a last direction and a last state using the first sample;
 - 4 c) obtaining a second sample, wherein a current state is determined using the second
 - 5 sample;
 - 6 d) generating an output responsive to the last sample, a last direction and their current
 - 7 state.
- 8 2. The method of claim 1, wherein the method is performed for an X axis pair and a Y axis
- 9 pair.
- 1 3. The method of claim 1, wherein generating an output further comprises looking up the
- 2 output in a positive look-up table if the direction is positive; and looking up the output in
- 3 a negative look-up table if the direction is negative.
- 1 4. The method of claim 1, wherein the quadrature signals are generated by a user input
- 2 device.
- 1 5. The method of claim 1, wherein the method further comprises determining motion and
- 2 rotation direction from the output.
- 1 6. The method of claim 3, wherein there are more than one positive look-up tables and more
- 2 than one negative look-up tables and the selection of a look-up table depends upon a
- 3 number of states that were skipped.
- 4 7. The method of claim 1, wherein the method further comprises summing outputs generated
- 5 during a predetermined period, and transmitting a sum for each axis of movement at the
- 6 end of the period.
- 1 ~~8.~~ A method for decoding a pair of quadrature signals, the method comprising:
 - 2 a) obtaining a first sample of the quadrature signals at a first time;
 - 3 b) determining a last direction and a last state from the first sample;
 - 4 c) obtaining a second sample of the quadrature signals at a second time; and
 - 5 d) determining an output signal using the last state, the last direction and the current
 - 6 state.
- 1 9. The method of claim 8, wherein the method further comprises summing output signals for
- 2 a predetermined length of time.
- 1 10. The method of claim 9, wherein the method further comprises providing an output signal
- 2 to a host computer comprised of a sum of outputs.

1 11. The method of claim 8, wherein the last direction is one of either positive or negative
2 direction.

1 12. The method of claim 11, wherein different lookup tables are used depending upon the last
2 direction being positive or negative.

1 13. A computer readable medium, having included thereon software code that when executed,
2 results in:

- 3 a) capture of a first sample of the quadrature signals at a first time;
- 4 b) capture of a second sample of the quadrature signals at a second time;
- 5 c) determination of a last direction;
- 6 d) generation of an output responsive to the first sample, the second sample and the last
7 direction.

1 14. The computer readable medium of claim 14, wherein the software code is contained in a
2 downloadable file.

1 15. The computer readable medium of claim 13, wherein the software code, when executed
2 further results in:

- 3 a) summation of outputs for a predetermined period of time, thereby creating a net
4 change sum; and
- 5 b) transmitting the net change sum to a host computer.